

Meeting Report

December 16, 2008

NC University Club, Raleigh, NC

Research Faculty Retreat:
Contributing to the Development of a Comprehensive Strategic
Plan for the Agricultural Research Stations

Report Submitted by:

Personal and Organizational Development

Mary Lou Addor
Makia Tillman
Jo Varley

Facilitation Provided by:

Personal and Organizational Development

Mary Lou Addor
Mitch Owen
Eleanor Stell

Contributing to the Development of a
Comprehensive Strategic Plan for the Agricultural Research Stations

**For Faculty Who Conduct Research on the
Agricultural Research Stations**

December 16, 2008

8:30am – 5:00pm
NC State University Club, Raleigh, NC

Purpose:

Benefit from the expertise and knowledge of the faculty who conduct research at the agricultural research stations.

The Executive Council and the Working Group are provided with essential information to assist them in developing the next steps for the comprehensive strategic plan which is due May 1, 2009.

Outcomes:

- 1) Continue to work together to:
 - a. Enhance the working relationships and communication between the College of Agriculture and Life Sciences at North Carolina State University, the School of Agriculture, and Environmental Sciences at North Carolina Agricultural and Technical State, and the North Carolina Department of Agriculture and Consumer Services.
 - b. Increase overall commitment toward developing the best future for North Carolina Agriculture;
 - c. Contribute in the development of a shared vision for the Agricultural Research Stations that is efficient and effective for the future;
 - d. Identify challenges and opportunities in achieving that shared vision.
- 2) Identify potential future research for the College of Agriculture and Life Sciences at North Carolina State University.
- 3) Faculty understands how their feedback will be used in developing a comprehensive strategic plan for the overall management of the agricultural research stations.

What have you done cooperatively (collaboratively) that is working to the betterment of the agricultural research stations?

Three groups were organized to respond to the first question. The responses from each group are provided below. Two or more groups identified five factors that were similar in contributing to the betterment of the Agricultural Research Stations such as:

1. Raising Money and In Kind Support
2. Sharing Equipment, Labor, & Resources
3. Extension and Outreach
4. Building Working Relationships
5. Teaching and Training

Summary of Factors Working to the Betterment
<p>I. Raising Money and In Kind Support</p> <ol style="list-style-type: none"> 1. Donation of supplies 2. Provide equipment (cost share) 3. New labs with private funds <p>II. Sharing:</p> <ol style="list-style-type: none"> 1. Equipment, Labor, & Resources <ol style="list-style-type: none"> a. fences, fertilizers, land 2. Human Resources <ol style="list-style-type: none"> a. Sharing staff and labor b. Working close with station management and staff c. Flexible work schedules d. Money for labor <p>III. Extension & Outreach</p> <ol style="list-style-type: none"> 1. Field Days and Outreach 2. Tours <p>IV: Build (Working) Relationships between: NCSU, NC A &T, NC DA &CS, Commodity Groups, Stakeholders</p> <ol style="list-style-type: none"> 1. Knowledge 2. Communication 3. Management of Experiments 4. Outside collaboration <ol style="list-style-type: none"> a. With other universities/ labs b. With industry/ grower groups <p>V. Teaching/Training</p> <ol style="list-style-type: none"> 1. Undergraduate and Graduate Education 2. Use of facilities for student training <p>VI: Research</p> <ol style="list-style-type: none"> 1. Applied Research 2. Basic Research 3. Research Infrastructure Improvement 4. Create Special Research Environments <p>VII: Variety/Germplasm Development</p>

VIII: Long Term Agricultural Diversification

VIII: Accomplishing the Mandate

X: Internal Exchange of Ideas

1. Communication with superintendent and staff
2. Facilities improvement

This section lists the responses provided by each group as indicated: the Green Team, the Blue Team, and the Red Team.

Green Team (Addor) Summary

- I. Raising Money and In Kind Support
- II. Sharing Equipment, Labor, & Resources (fences, fertilizers, land)
- III. Outreach
- IV. Build Relationships
 - a. Knowledge
 - b. Communication
 - c. Management of Experiments
- V. Accomplishing the Mandate
 - a. Create Special Research Environments

1. Raising Money & In-Kind Support

- a. Shared funding with Sandhills Station for organic mulch, landscape fabric, and bird netting for blueberry breeding research
- b. Worked with NC Wine Grape Council to allocate funding to establish a muscadine breeding program in the Horticulture Science Department. Funding used to construct more than an acre trellis system at the Castle Hayne Station to establish a germplasm collection.
- c. Through an industry donation of a chlorine-injection system and department funds, we set up an irrigation system for HFL/JCRA that allows us to disconnect from Raleigh water. This will be critical in future drought years when water restrictions are imposed.
- d. Golden Leaf Funds tunnels, labor,
- e. Research station awarded Tobacco Trust Fund money to support Bramble Research equipment, supplies, labor
- f. Provided funding for basic equipment for successful operation of the Hort. Crops Research Station at Castle Hayne through grant funding (Orchard tractor, flail mower, mulch applicator) and permanent loan from industry (blueberry harvester, grading line)
- g. Provide in-kind payment to offset high labor cost associated with hand-harvest of peanut breeding plots (\$3000-\$5000) seed bill covered at Peanut Belt Station)
- h. Bring in industry (groups)
 - i. Money

- ii. Products (fertilize, pesticides, irrigation)
 - iii. Sponsorship of events
 - i. Using grant money to offset station expenses
 - j. We raise money to make the stations work. That contributes to a success. But it's a failure that we have to do this at all.
 - k. Contributed to infrastructure of the stations
 - i. Linear irrigation system (coop with NCDA)
 - ii. Tractor, plaster, tiller housed at stations
 - j. Faculty funding (partial) building cost for stations. Faculty funding equipment.
 - k. Grant participation
 - i. Time and resources cost share
 - l. Raised many thousands of dollars to help buy basic equipment for stations use.
- 2. Sharing Equipment, Labor, and Resources (fences, fertilizers, land)**
- a. Share equipment with other faculty that is used on stations (planter, tractor, sprayer, etc)
 - b. Providing resources to complete studies
 - c. Sharing and modification of station equipment to meet experimental objectives
 - d. Contribution of labor for good of station
 - e. The sharing of resources among project leaders on station for equipment, i.e., sweet potato digger and purchase of deer fences (Kinston)
 - f. Contributed equipment to Research Station
 - i. Linear irrigation system (co-op of NC Department of Agricultural)
 - ii. Tractor, planter, tillage equipment housed and used at stations
 - a. Sharing equipment
 - b. Sharing plots of land for multiple projects with different objectives and needs
 - c. Shared research station and research project equipment and labor to accomplish research project maintenance and experimental requirements in a timely manner.
 - d. Share resources (equipment, labor). Collaborative projects with other researchers.
- 3. Outreach**
- a. Asking and receiving specific training (ex. Food Safety)
 - b. Field Days (2)
 - c. Workshops for clientele at Research Station
 - d. Useful resource for local growers contacts
 - e. Demonstration plots for public education
 - f. In-service training for Agents and use of facilities – Kinston
 - g. Successful implementation of field days; specialty melon and crops at Kinston, Sweet potato (Kinston and Clinton), strawberries (Clayton), small fruits (Sandhills)
 - h. Agent trainings
 - i. Workshops
- 4. Build Relationships – University and Stations at Station Level/"Partnerships"**
- Our peanut agronomy/weed management program have worked hard to cultivate relationships with station managers and workers through providing items they need buy they have difficulty purchasing, by including station managers and workers as authors on scientific journals when

appropriate, by writing letters to appropriate “higher ups” acknowledging assistance from the stations, attempting to develop relationships between stations and Extension Agents so that everyone appreciates what everyone else is doing and contributing, providing meals several times during the year to create goodwill, and in general making sure station people and other technical help understand that they are vital to program successes and that they have helped the program move forward.

a. Knowledge

- i. Provide opportunities for professional development of station personnel by attending growers meetings (i.e., Expo), Agent in-service training, or a course/class.
- ii. Providing resources and expertise to complete studies
- iii. Act as impromptu pest consultant to station personnel (correct product, rates, calibration, etc.)
- iv. Training for Station staff (i.e. Food safety)
- v. Graduate Student studies

b. Communication

- i. Discussion and implementation of changes in experimental protocol to make work more efficient and effective
- ii. Work closely with station personnel at the Piedmont Research Station to plant, manage, and harvest experiments

c. Management of Experiments

- i. The construction and completion of the 5 sweet potato rooms in limited times in 2008 at Clinton. Lots of station workers made this happen.
- ii. Some superintendents discuss land rotation with Principle Investigators and are fair in land allocation.
- iii. Some stations’ managers discuss with Principle Investigator cultural practices before implementing them, and try to provide best management – partners in research
- iv. Cooperation to work through issues related to transgenic research (plot isolation, segregated harvest & storage of crop, regulatory site visits)
- v. Experimental plot maintenance -- eyes on research when I’m not present
- vi. Excellent team work with all station workers in Waynesville to harvest and collect pumpkin data; collaborative among 3 states: NC, TN, GA
- vii. Some stations’ managers are willing to try new things (research thinking) and provide extra help (labor, time).
- viii. Worked with station superintendent and faculty in 3 Departments to establish a multi-year crop sequence study to examine pest management affects of multiple crop rotations.
- ix. The accommodations of putting in some new squash studies in Clayton with limited time to plan, and the preparation and labor to make it a successful study (2007).

5. Accomplishing the Mandate

- a. Support graduate student research
- b. Development of turf cultivars
- c. Develop new blueberry and strawberry cultivars

- d. Develop new raspberry cultivars
- e. Developing hemlock tree resistant to insect pests. Cooperating with forest geneticists and the upper mountain research station
- f. Peanut cultivar development
- g. Development of variety recommendation (i.e. plant variety/cultivar)
- h. Testing tillage equipment for "universal tillage wheel??"
- i. Development of new, improved soil insect pest management methods for sweet potato
- j. Developing effective pest management strategies (weeds, insects, disease, nematodes)
- k. Evaluation of wheat seed ???
- l. Development of soybean cultivars
- m. Season extension for horticultural crops through use of high tunnels.
- n. Investigating new fertilizers being marketed in the state. These fertilizers are products that producers near the stations are considering using.
- o. Evaluation of wheat cultivars for yield and insect and disease resistance.
- p. Developing fraser fir Christmas trees resistant to insect pests. Cooperating with forest geneticists and the Upper Mountain Research Station and the Mountain Research Station.

6. Create Special Research Environments

- a. Intensive water management (droughty soils, irrigation)
- b. Providing disease, insect and weedy plots for use by researchers
- c. Development of early planting systems for wheat growers
- d. Season Extension for horticultural crops through use of high tunnels
- e. Off-season production of horticultural crops
- f. Extend harvest season using multiple stations
- g. Establishing areas for organic research
- h. The additional laying of plastic rows to be able to increase are for melon evaluation in Kinston (2008)

Blue Team (Owen) Summary	
II. Field Days and Outreach	
a. Tours	
b. Field days	
III. Human Resources	
a. Sharing staff and labor	
b. Working close with station management and staff	
c. Flexible work schedules	
d. Money for labor	
IV. Funding and In-kind	
a. Donation of supplies	
b. Provide equipment (cost share)	
c. New labs with private funds	
V. Outside collaboration	
a. With other universities/ labs	

- b. With industry/ grower groups
- VI. Internal Exchange of Ideas
 - a. Communication with superintendent and staff
 - b. Facilities improvement
- VII. Teaching/ Training
 - a. Use of facilities for student training

1. Field Days Outreach

- a. Host/organize field days
- b. Field days (2)
- c. Field days showcasing research and station facilities and capabilities
- d. Field day planning
- e. Participated in numerous tours of research station projects by CALS Administration
- f. Tours of stations of national and international collaborators
- g. Cooperate with superintendents on station tours

2. Human Resources

- a. Funding staff development
- b. Conduct research with as little station labor as possible
- c. We used to do station reviews with stakeholders
- d. Flexibility with work schedules
- e. Work closely with management and staff
- f. Provide part-time labor
- g. Provide positive feedback to superintendents/workers when appropriate
- h. Develop research projects that best utilize the facilities and staff
- i. Work closely with station staff to ensure that field trials are installed and managed efficiently
- j. Provide temporary labor
- k. Develop work plans to optimize utilization of station human resources
- l. Keep in close contact with farm managers when actively working at the station
- m. Funded summer help who worked both for our program and the general station needs
- n. Meet with superintendents before planting to plan management strategies
- o. Provide money for labor
- p. Provided funds (\$) for temporary labor
- q. Give positive feedback to station staff

3. Teaching/ Training

- a. Allowed my lab to be used for Vet School Training for students
- b. Introduce students to the resources offered by our field stations
- c. Train future Researchers/Teachers

4. Money (\$)/ In-Kind

- a. Utilize grant funds to purchase equipment/supplies for station uses
- b. Grower (nearby) resources
- c. Obtain grants to pay for labor, supplies, equipment
- d. Donations of Ag. Chemicals

- e. Purchase equipment for use by station that will help our research
- f. Provide materials (chemicals) and equipment with station
- g. Results from trials that would not have been possible without station cooperation
- h. Provide support for equipment that otherwise would not be available
- i. Shared facilities and staff for aquaculture research—Lake Wheeler Road
- j. Provide fertilizer and insecticides for the central crops station. Also have purchased irrigation equipment
- k. Help with equipment needs
- l. Cost share new equipment
- m. Share labor and equipment
- n. Built lab with private funds—now used for University research
- o. Provide money for supplies and equipment
- p. Combine research across projects
- q. Develop ways to reduce expenses during this budget crisis
- r. Provide pesticides for maintenance sprays

5. Outside Collaboration: Industry, growers and other universities and states

- a. Worked collaboratively with faculty from other departments on research project—two depts.
- b. Multiple collaboration with institutions
- c. Collaborations with industry
- d. We cannot work singularly to solve problems
- e. Research projects that utilize industry support
- f. Advocate support from grower groups

6. Internal Exchange of Ideas

- a. Worked with station superintendent to develop disease control plans for use on stations (for general studies not involving disease control)
- b. Work with superintendent to get appropriate land resources for research
- c. Enhances ability to acquire funding
- d. Advice on crop management
- e. Work with superintendents to interpret soil survey for better allocation of land resources
- f. Applied research projects
- g. Enhance utilization of resources
- h. Develop plan for GMO studies and regulatory issues
- i. Discuss ways to improve facilities

Red Team (Stell) Summary	
I.	Extension and Outreach
II.	Undergraduate and Graduate Education
III.	Applied Research
IV.	Basic Research
V.	Variety/Germplasm Development
VI.	Research Infrastructure Improvement
VII.	Long Term Agricultural Diversification
VIII.	Relationship Building (NCSU, NC A &T, NC DA &CS, Commodity Groups, Stakeholders).

1. Extension/ Outreach (Field days, Training)

- a. Demonstrations/ research plots for grower education at field days
- b. Helped organize commodity focused events to draw producers to the stations
- c. Field days and agent training

2. Undergraduate/ Graduate Education

- a. Graduate student training
- b. Graduate student research
- c. Undergraduate research experience
- d. Graduate student research and training

3. Applied Research

- a. Working to identify local information needs that can be addressed locally. (Interplay with superintendents and local producers)
- b. Developing data to get new pesticide registration
- c. Cooperative forage & grazing studies
- d. Efficacy trials that lead to improve pest management
- e. Applied research to support Extension program in all areas of production and management
- f. Identify needs of NC Farmers and develop solutions
- g. Routinely plant and harvest (750 acres of research field plots at TRS, HCRS, CRS, LCRS
- h. Collaborative work with stations is essential for development of valid/useful pest control practices for NC.
- i. Integrated research between NCSU, producers and stations with equal contributions from each
- j. Collect data for Extension publications
- k. Grant money

4. Basic Research

- a. Understanding basic aspects of animal health and production efficiency
- b. First genetic map and QTL analyses completed based on support and HCRS and CRS/LCRS
- c. Model to use industry animals/inputs (feed) in research at stations
- d. Plant disease studies to advance and evaluate germplasm
- e. Grant money

5. Variety/ Germplasm Development

- a. Variety and germplasm development
- b. Plant germplasm evaluation and preservation
- c. Development of drought tolerant soybean varieties for NC and the South. (Sandhills primarily)
- d. At CCRS, have produced less than a million true SP seed, foundation of variety develop.
- e. Cooperative breeding of corn, wheat and forage crops
- f. Established at potato breeding program at TRS
- g. Variety evaluation OVT

- h. Development of soy foods varieties so that NC farmers can compete in the lucrative export market
 - i. Development of soybean germplasm with resistance to salt stress, ozone, and elemental deficiencies
 - j. Released 1 new potato variety based, in part, on research station work at TRS
 - k. Generation of royalty revenue
 - l. Have developed two new varieties that are widely grown in NC and US
- 6. Research Infrastructure Improvements**
- a. Obtained big grants for structures and equipment
 - b. Purchased equipment and fertilizers
 - c. Use of grant funds to purchase items on station (i.e. irrigation equipment)
 - d. Getting support from Agribusiness to reduce cost (donation of pesticides)
 - e. Provided funding for development infrastructure with grant money
 - f. Contributed weigh systems to two research stations so that PIs without their own equipment would have the ability to harvest plots
 - g. Have improved sweet potato storage facilities at HCRS
 - h. Have built two new tunnel houses at HCRS
 - i. Revolutionized the process of harvesting cotton plots on stations to avoid losses
 - j. Persuaded the research stations to purchase cotton pickers so that plots could be harvested in a timely manner
 - k. Pre-growing season meeting of PI's and station leaders to discuss crop plans, equipment needs, sharing costs, problems from past season and proposed solutions
 - l. In-kind donations of agri-chemicals and equipment by project leader
 - m. Model to use industry animals and inputs (feed, etc.) to conduct research
- 7. Long Term Ag. Diversification Research**
- a. New industrial – SP work initiated with support of HCRS, CRS/ LCRS, WNSD
 - b. Using data generated at research stations have brought in new grant money
 - c. Mining the soybean germplasm collection to diversify the farmer's crop and bring in novel yield genes, as well as disease resistance
 - d. New purple SP developed with support of CRS, HCRS
 - e. New grain crops
 - f. Integration of animal crops in farming systems
 - g. Small farming systems development
- 8. Relationship Building (NCSU, NC A&T, NCDA, Commodity Groups, Farmers)**
- a. Established working relationships
 - b. Pooling of resources of faculty and research staff personnel
 - c. NSDA-ARS collaboration with NCDA&CS and NCSU
 - d. Joint collaboration is politically stronger than agencies operating independently

What will the future of the agricultural research stations look like (one that is efficient and effective)? Think in terms of the places, the people, the product, the policies and procedures

Definitions: (request participants suspend judgment if they want to wordsmith the definitions).

Efficient: working with as little waste of resources and energy as possible

Effective: producing or capable of producing an intended result: able to accomplish a purpose; works well as a means or remedy.

Three groups were organized to respond to the second question. The responses from each group are provided below. Two or more groups identified five similar factors that described the future of the Agricultural Research Station such as:

1. High quality station staff
2. Land Management: use, location,...
3. Policy dollars / System for Funding Allocation
4. Facilities Infrastructure
5. Efficient management of stations

Summary: An Efficient and Effective Agricultural Research Station for the Future

I. High quality station staff

1. Staff expertise
 - a. Training of staff
 - b. Attitude (Can Do!
2. Staff Attributes
 - a. Training, Salary, Personal Development
3. Superintendent (quality/motivated/cooperative)

II. Land Management: Location, Use...

1. Land use planning – utilization, selling, etc.
2. Land and Land Use
 - a. Space
 - b. Management utilization
 - c. Organic
 - d. Stewardship
3. Land Facility Management
4. Sufficient Quantitative and Qualitative Land Resources
 - a. Land/faculty in environment
 - b. Land use request
 - c. Land/facility resources

III. Policy dollars / System for Funding Allocation

1. New Funding Sources
2. Adequate Dollars

IV: Facilities infrastructure (state of art)

1. State-of-the-art equipment/technology (livestock, animal, plant, crops)
2. Infrastructure (Modernization/Tech Utilization)

V. Efficient management of stations

1. Coordination/communication between administrative agencies
2. Station management and communication between superintendent, staff, and PI
3. Management and Accountability (Communication and Re-evaluation)
4. Research First
5. Research Station Mission
6. Focus on Research
7. Diverse System Focused Stations
 - a. Location
 - b. Environmental needs

Others ideas provided by a group.

I. Geographical/Commodity Impact

1. Importance of Geographical distribution and regional commodity focus

II. Research Station Promotion/Marketing

1. Outreach of Success to Public / General Assembly

III. Research products should not be penalized**Green Team (Addor) Summary****I. New Funding Sources****II. Adequate Dollars****III. State-of-the-art equipment/technology (livestock, animal, plant, crops)****IV. Land Facility Management****V. Sufficient Quantitative and Qualitative Land Resources**

1. Land/faculty in environment
2. Land use request
3. Land/facility resources

VI: High quality station staff**VII: Superintendent (quality/motivated/cooperative)****VIII: Efficient management of stations****1. New funding sources**

- a. Explore new sources of funding for projects on R. S.
- b. Create research station "Foundation"?
- c. Seed royalty share to stations used for cultivar developments
- d. Sell university and NCDA land to capitalize research stations (not back into general fund!)
- e. Corporate support for equipment, ag. chemicals?

2. Adequate money

- a. Enough money to work
- b. Reasonable feed costs
- c. Better mechanisms to transfer funds from University to station labor \$
- d. Avoid the “pay for play” mindset. This changes collaborative nature of research—plot maintenance becomes a service
- e. R.S. write grants
- f. No user fees! No “pay for play”

3. State-of-the-art equipment/technology (livestock, animal, plant, crops)

- a. Several stations with centralized maintenance facilities
- b. Use of GPS for management of field experiments
- c. Equipment availability on site to perform routine (and non-routine) analyses to facilitate research efforts
- d. Need modern up-to-date facilities and equipment that utilizes the technology of today and tomorrow
- e. More informative websites
- f. Modern equipment
- g. Perhaps more computerization of cultural practices (i.e. fertilization)
- h. Modern equipment that shares commonality across stations to make multiple station work more uniform
- i. Take/ store : digital images of plots at regular intervals
- j. To remain relevant will require state of the art equipment / technology for production
- k. Modern facilities for livestock res.
- l. Have up-to-date equipment
- m. Have cutting edge equipment
- n. Updated equipment (e.g. for particular row spacings)
- o. Wireless access at research stations
- p. Small plot equipment available at stations
- q. Cell phones and adequate computer access for station personnel
- r. Starwars like; teletransporters to reduce PI travel time
- s. More use of GPS equipment (perhaps sharing between stations)
- t. Excellent irrigation and water resources
- u. Improved stations infrastructure and current equipment (variable by crops current) across crops
- v. Increase fuel efficiency as it related to farm equipment, travel to research stations

4. Land/ Facility Management

- a. Land with good drainage control
- b. Facilities to provide/ manage special environments (biotics & abiotics stresses)
- c. Don't laser plane land so we grow on subsoils
- d. Transgenic crops will be routinely tested on research stated adapted to meet confinement criteria, etc. Labs and greenhouses will be available on station to assist in this research

- e. Well-managed diseased nurseries weedy areas for weed science research
- f. Areas for long term rotational and other expts
- g. Specialty needs; pests-abiotic stress
- h. Proper rotation to avoid disease problems

5. Sufficient Quantitative and Qualitative Land Resources

- a. Land/faculty in environment
- b. Land use request
 - i. Improved land use request process
 - ii. Flexibility in timing 092s due Jan. 31- we don't know if we have resources sometime until Spring
 - iii. Land assignment to research stations near NCSU will take into account: 1. Number of visits per season to the plots by PI's and students; 2. Size of plots needed; 3. Soil types, specials equipment needs; 4. Other
 - iv. Each project= separate 092; no "hiding/ piggy backing"
- c. Land/facility resources
 - i. One or more station close to Raleigh
 - ii. One superstation near Raleigh with latest technology and lots of personnel and lot of good land. Satellite stations in different soil and climate ones for different crops
 - iii. Research stations in all physiographic areas of state and on all major soil types that producers in the state farm
 - iv. Stations close to university while keeping diverse soils and climates
 - v. Super stations: turn-key operations; adequate labor; adequate resources; partnerships with companies (equip, pesticide)
 - vi. Well managed stations spread across state's geographic regions
 - vii. Concentration of efforts in specific NC Areas: drought resistance, off-season production, sustainable production
 - viii. System represents all distinct agro-ecological zones in state, preferably multiple stations per zone
 - ix. Have a large near campus station with good land and sufficient support
 - x. Plenty of land
 - xi. Large, local animal populations for food animal research (i.e. pig, cattle, chickens, goats)

6. High quality station staff

- a. Educated managers and staff
- b. Well-trained station personnel with a "Research First" mentality
- c. Fully staffed, better salaries to retain good personnel
- d. Adequate seasonal personnel (e.g. student help) ex. During harvests
- e. Highly trained staff across the board with appropriate compensation
- f. Pay good salaries; promotions possible
- g. Need workers that are trained that have expertise and knowledge (we lack that in many cases)

- h. Personnel structure at some stations needs to change. Too many bosses! Not enough bodies to do the work
- i. "Labor" will be provided to a greater extent by robotics and other automated equipment
- j. Personnel is paid decent wages and by merit (change current pay scale and system)
- k. Well-trained staff with clear path for professional development/ advancement
- l. People to do the work

7. Superintendent (qual./motivated/coop.)

- a. One superintendent per station in locations where multiple stations are managed by one person
- b. Managers and staff will read and follow 0-92 throughout the project duration. Follow up with PI on q's of 0-92.
- c. Annual review of station management from PI's
- d. All stations have good managers (research thinking)
- e. Evaluation of station managers by PI's. Feedback that is useful; currently no feedback or spotty
- f. Well trained managers who care about their performance
- g. Re-integration of communication between station managers and university researchers
- h. Meet NCSU (Dept. heads), NCDA, A&T with station managers to improve management (regularly)
- i. Some superintendents will manage more than one location (station clusters)

8. Efficient management of stations

- a. Long-term electronic record keeping on hand use. Including specific treatments to plots that could impact quality or heterogeneity of plots in future years
- b. Ability/ freedom to communicate ideas and observations about expts/plots
- c. Greater move to low input/ organic production systems
- d. Consistent management practice across stations
- e. Energy efficient (produce biofuels, solar power, etc.) to run electrical grid and equipment
- f. Bulk purchase or acquisition of fertilizers, ag. chemicals to enhance uniformity of culturm practices across stations
- g. More collaborative projects with faculty across dept.
- h. Resource allocation process includes end-of-season evaluation by users annual review sessions
- i. Well equipped and managed to accommodate all projects
- j. Travel cost efficiency- on station housing? Kannapolis- like shuttle service?
- k. Flexibility in marketing resources (timber)
- l. Need a consistent mechanism to correct challenges/ issues
- m. Comply with food safety regulations
- n. Pre-season meeting with key staff for better communication
- o. Encouraged/ embrace innovation

Blue Team (Owen) Summary

- i. Facilities infrastructure (state of art)
- ii. Coordination/communication between administrative agencies
- iii. Staff expertise
 - 1. Training of staff
 - 2. Attitude (Can Do!)
- iv. Station management and communications
 - 1. Superintendents
 - 2. Staff
 - 3. PI
- v. Focus on Research
- vi. Diverse System Focused Stations
 - 1. Location
 - 2. Environmental needs
- I. Research products should not be penalized
- II. Land and Land Use
 - 1. Space
 - 2. Management utilization
 - 3. Organic
 - 4. Stewardship

1. Facilities infrastructure state of the art

- a. Keep equipment and facilities up to date
- b. Better equipment
- c. Internet connectivity at each building of every research station
- d. Equipment sharing
- e. Equipment tailored to the tasks
- f. Has modern working equipment for crop protection, weed control, and land preparation
- g. Sufficient funding for approved projects
- h. State of the art facilities (no band-aids)
- i. Well-maintained equipment, facilities and grounds
- j. Have up to date equipment and cultural expertise
- k. Current facilities to address industry issues
- l. Equipment is modern and in good repair
- m. Facilities for outreach
- n. State of the art field equipment with adaptations for small plot work
- o. Cutting edge methods being used/evaluated
- p. State of the art equipment for weather data collection and communication
- q. Make sure equipment is working properly
- r. Irrigation

- s. Resources (facilities and site resources) can be relied upon for future use in research, extension and teaching
- t. Highly visible to the public – a showplace
- u. Improve facilities to reflect changes in the industry
- v. Station is “user-friendly” for occasional visitors, such as university classes
- w. Have enough post-harvest storage space for all PI’s – not just a few
- x. Staff have good resources for communication – computers, cell phones, PDAs
- y. Adequately funded (staff, equipment, buildings)
- z. Make sure there is enough funding for supplies and staff
- aa. Resources that permit both basic and applied research
- bb. Up to date communications systems
- cc. Functional equipment available for the necessary tasks
- dd. Units must be well maintained
- ee. Contemporary labs

2. Coordination and communication between agencies

- a. Maintain NCDA funding base for research stations
- b. Keep current arrangement between NCDA and NCSU regarding research stations
- c. Maintain collaboration between NCDA and NCSU
- d. Clear understanding of role of research station in research process
- e. Close coordination between NCSU and NCDA Division of Research Station in appropriate equipment and facility development and purchases
- f. Keep communications open between NCDA and NCSU regarding research stations
- g. More input by NCSU in decisions by NCDA Division of Research Stations
- h. Maintain memorandum of Agreement between NCDA and NCSU regarding research stations
- i. Close coordination between NCSU and NCDA Division of Research Stations in hiring

3. Staff Expertise

- a. Staff: “Can Do” attitude and operation (2)
- b. Has the human resources needed to manage well the crops being grown
- c. Train staff in production practices
- d. Hire staff that are interested in their work (more than just a job)
- e. Staff appreciates their role in the research process
- f. Incentives for staff to perform tangible reward for good work
- g. Staff – understanding/appreciation for the research
- h. Well-compensated, well-trained motivated staff
- i. Create a collegial atmosphere between units at the stations
- j. Highly motivated staff (same as now)
- k. Staff workload is realistic to allow time to be proactive
- l. Efficient but not overextended (staffing)
- m. Continuity of staff—keep trained and effective personnel
- n. Merit based evaluations of superintendents/other station employees
- o. Well informed staff

- p. Retaining effective staff. Let go of non-effective staff
- q. Trained staff
- r. Staff trained and continuing education
- s. Better educated staff
- t. Make sure there is enough staff to meet all needs of PI's not just a select few
- u. Staff understanding of industry and practices to provide appropriate research equipment and facilities

4. Station management and communication

- a. Good communication between station and PI's
- b. Excellent coordination of labor to optimize research efficiency
- c. Better response time for production requests during season
- d. Use good production practices. Make sure crops are being watered properly and maintenance sprays are timely
- e. Flexibility to accommodate short-term or occasional projects
- f. Superintendents responsive to researcher needs/feedback
- g. Be flexible with regards to timing of land requests
- h. Develop a system to address immediate needs that are being met. For example with watering issues – problems have to be resolved quickly
- i. Managers who respond rapidly to needs of the research project

5. Focus on Research

- a. Research is first priority. Commodity sales lower priority
- b. Focus on research mission(s)
- c. Efficiency in scheduling of research projects
- d. Optimization of station's resources
- e. Ensure that research maximizes utilization
- f. Don't let the State Fair interfere with research conduction on the station. Make research a priority

6. Diverse systems focused stations

- a. Diverse soils and geographic locations for crop-specific needs
- b. Must be located in areas relevant to clientele
- c. Location, location, location
- d. Focus on specific crops
- e. Maintain a station nearby (20 minutes) NCSU for experiments/nurseries that need daily attention from researchers
- f. Protected from urban encroachment
- g. Appropriate soils/climate for studies on range of crops
- h. Research stations located in diverse ecological/climate regions of NC
- i. Need facilities close enough to campus to allow students in 3-hour labs to conduct projects
- j. Maintain Piedmont Research Station (Salisbury, NC) – Proximity to dairy industry

7. Research Products Should Not be Penalized

- a. Remove commodity price barriers imposed by legislature
- b. Sale of (premium) product to open market (not bids) to return funds to projects

8. Land and Land Use

- a. Lots of good, uniform land for experiments
- b. Expanded organic study capability
- c. Locations with better soil types. More land needed for rotation
- d. Excellent management of the fields/land
- e. Adequate space for large experiments and optimal rotations
- f. Land available for weed research. We must be able to see a field in weeds or plant weeds.

Red Team (Stell) Summary	
I.	Geographical/Commodity Impact <ul style="list-style-type: none">1. Importance of Geographical distribution and regional commodity focus
I.	Managing Land and Location <ul style="list-style-type: none">1. (Land use planning – utilization, selling, etc.)
I.	Research Station Mission
/.	Research First
/.	Research Station Promotion/Marketing <ul style="list-style-type: none">1. Outreach of Success to Public / General Assembly
I.	Policy dollars / System for Funding Allocation
I.	Infrastructure (Modernization/Tech Utilization)
I.	Staff Attributes (Training, Salary, Personal Development)
K.	Management and Accountability (Communication and Re-evaluation)

1. Geographical and Commodity Impact

- a. Responsiveness to NC needs
- b. Strategically located to meet ALL commodity and regional research needs
- c. Work focused on local needs that clearly relate to producers where the stations are located (strengthen local political support)
- d. More focus at individual stations
- e. More integrated systems research (animals, plant, aquaculture)
- f. Coordination of programs across all stations and field labs. “Commodity focused research/extension plans”
- g. Closer relationship between extension and research stations – Extension faculty and Research faculty should talk

2. Managing Land and Location

- a. Fight encroachment of industry onto prime research land – i.e. Caswell
- b. A superstation within 45 minutes of campus for research requiring daily visits
- c. Retain the best land
- d. Large uniform areas of land with appropriate rotation for research

- e. Divert land not suited to research to leasing, timber, or some source of revenue that does not detract from research
- f. Treat the three farms at Kinston as a superstation. Purchase nearby uniform land. This is the best land closest to campus.
- g. Maintains a diversity of environments for breeding – i.e., high yield at Caswell, drought at Sandhills
- h. A reduced number of research stations sited in key environments, but improved research station system overall

3. Research Station Mission

- a. Stations must put research first and foremost and outreach
- b. No domination of “For Profit” outlook by station supervisor
- c. Make sure the system promotes field research rather than discouraging it
- d. Open and positive relationships between partners at all levels, not just at the faculty/superintendent level
- e. “2” vs “1” issue settled (i.e. University and NCDA vs. ?)
- f. Similar policy and procedures across research stations and university field labs

4. Research Station Promotion/Marketing

- a. Key administrators clearly articulating and advocating for research stations and building a case for their importance
- b. Think about impact beyond state lines (significance in the region i.e., Fletcher, Mills River)
- c. Economic assessment of research station based outputs
- d. Make sure that NCSU, NCDA, NC Legislature understand the critical importance of field research to food security

5. Policy money / system for allocating funding

- a. System for allocating resources among potential projects (no good system in place now)
- b. When grant involves research station, make sure overhead goes to Research Station (this does not happen now)
- c. Manage timber so that it is a source of revenue for equipment and capital improvements on station. Change laws as needed to accomplish this.
- d. Transparent and clear research station fee policy
- e. No discrimination between crops
- f. Improved transparency of research money support for research stations including grant and royalty funds
- g. Resource allocations must be equitable across PI projects. Need mechanism for determining who gets what
- h. System to allocate resources to situations and PI’s for research
- i. Focused effort, less dilution of current resources
- j. Structured system for cost recovery
- k. Increased state funding
- l. Reduce emphasis on ‘General Crop’ farming at stations. General crop farming to be done only when it is profitable, often it is not
- m. Coordinated inputs across stations

6. Infrastructure

- a. Infrastructure improvements needed (equipment, buildings)
- b. Infrastructure that functions (i.e., irrigation)
- c. New buildings at CRS to facilitate post harvest research
- d. Overnight facilities for students and faculty
- e. On-site overnight accommodations
- f. Central location for indoor storage of equipment, plus large shop and mechanics
- g. Better system for sustaining infrastructure needs for the station, both from allocated money and grant money
- h. Investment in new facilities that allow research to be industry relevant
- i. Overnight stays provided by station
- j. More remote access to real-time data collection
- k. Less people, more mechanization?
- l. Research stations with modernized equipment (tractors, harvesters, graders, etc)
- m. Long term plans for infrastructure maintenance and improvement
- n. Meet the needs of changing/evolutionary research requirements
- o. Large facility (state-of-art) within one hour of campus
- p. Should be “model” farms (technology, equipment, etc.)

7. Staff Attributes

- a. Trained personnel
- b. Less people, increased skills?
- c. Superintendents and Assists with excellent management skills
- d. Staffed with individuals willing to implement and use new technologies
- e. Leaders in innovation tech application
- f. Station Superintendents and research leaders engaged in grant writing to fund work at research stations
- g. Research stations with adequate number of trained personnel

8. Management and Accountability (communication/reevaluations)

- a. A good system for accountability of research station productivity (annual reports?)
- b. Critically evaluate each station's programs periodically to strengthen support of stakeholders and to make sure all stations are used efficiently and effectively
- c. Annual review of program with Superintendents
- d. Consolidation/reduction of administration
- e. Greater emphasis on team building that promotes research productivity
- f. Funds for training and retention of station staff
- g. Must operate in the most efficient manner possible. Eliminate unneeded practices, infrastructure, etc. Follow intelligent purchasing decisions for inputs (fuel, equipment, pest control, chemicals, etc)
- h. Improved feedback and communication between project leaders and research station
- i. Clear lines of communication and clear lines of authority (on research stations)
- j. Strategic reallocation of resources, including selling existing stations and investments in infrastructure improvement

- k. Better communication between PI and station on procedures and rules
- l. More integration between stations (resources and people)

What are the challenges that make achieving efficient and effective agricultural research stations for the future difficult?

All three groups responded to the third question; the Green Team categorized the information generated and provided the summary.

Summary of the Challenges	
I.	Communications between NCDA/CS and NCSU and Administration to all
II.	Station Management inefficiencies
III.	Labor – needs/training/quality and quantity communication
IV.	Politics – resistance to change/realities
V.	Money – inadequate funds for all organizations
VI.	Land – quality and quantity of research land

1. Communication between organization and administration

- a. Poor communication NCDA / NCSU
- b. Lack of communication between
 - i. PI's
 - ii. PI's and Admin
 - iii. PI's and station staff

2. Station Management – inefficiencies

- a. Infrastructure focused on traditional Ag is not always compatible with newer directions – specialty crops, more intensively managed crops, etc.
- b. Research first “Farming” for funds second
- c. Make sure that all management and staff have a commitment to conduct research
- d. Poor management on some stations
- e. Research station not focused
- f. Challenge: getting station to be research minded
- g. Need better equipment at stations
- h. More research stations to address “peri-urban” agriculture specialty crops
- i. Need locations that allow weed establishment
- j. No irrigation of two of the three farms at Kinston (Tobacco Research Farm and Caswell)
- k. “Farming” on stations; taking priority over research
- l. Antiquated equipment and production practices

- m. Antiquated “receipts” system do general crop farming only where clearly profitable and does not interfere with Research

3. Labor – quality and quantity

- a. Not enough labor to do the work
- b. Station staff is unresponsive
- c. Need trained staff
- d. Challenge: technical training of Staff
- e. Recruiting and retaining good staff
- f. Need interested station staff
- g. Station managers not answerable to researchers. No penalty for bad management/no reward for good management.
- h. Capabilities and interests of station management and personnel (in some cases)
- i. Inability to attract and keep good staff – once trained, staff often leave for more pay
- j. Lack of understanding of research concepts (and mission) by station staff
- k. Under-staffed stations

4. Politics – realities/resistant to change

- a. Higher level administration need to work more effectively together and develop a shared vision/mission. This is not apparent at this time
- b. Lack of focus by CALS
- c. Entrenched administration and protocols
- d. Administrators who do not get along
- e. Non-transparent budget at NCARS
- f. Lack of public awareness of the importance of Agricultural Research Programs
- g. Duplication in NC with other states. Could use regional cooperation in some areas
- h. Depends on how citizens of NC view agriculture (long term). Agriculture has a diminished voice in an increasingly industrial state.
- i. Merging the strengths and weaknesses of NCDA and NCSU so all works smoothly from a management point of view as well as implementation
- j. Laws which prevent timber cuts on NCSU stations from funding equipment and capital improvements
- k. Hard ball politics is guiding decisions that affect scientific productivity. Let the field scientists decide which stations need to stay open
- l. Political environment that allows the research stations to maximize efficiency such as closing stations, consolidation resources
- m. “Trendy” funding mismatch of S.T. funds to L.T. priorities (S.T. funding horizon)
- n. Political mess between NCDA and NCSU administration. NCSU role in this not highly supported by stakeholders
- o. Is Ag still important to Legislature
- p. No transparency in station management oversight
- q. State Fair should not interfere with sweet potato harvest. Make research a priority
- r. Politics (resistance to change)

- s. Very little public awareness of benefits of public-sector ag research. Little political support from general public
- t. Convoluted bureaucracy
- u. Non research and non ag individuals making directions/decisions
- v. Turf battles: NCDA vs. NCSU (vs. NCA&T?)
- w. Shrinking political base of ag
- x. Lack of understanding what ag does for society
- y. Society doesn't know where their food comes from. Misperception with 1950s ag production

5. Money – Inadequate funding NCSU, NCDA/CS, NCA&T

- a. Salaries that are too low
- b. Not enough money to serve stations, fee, fertilizer, or salaries
- c. Money
- d. Money to run stations
- e. Distributing limited money to stations. Need fewer stations with same money so they will be adequately funded
- f. More funds need to be invested
- g. Increasing costs of fertilizer and other resources
- h. Money
 - i. Money for salaries, updated equipment, and investing in technologies
 - ii. Limited funding
 - iii. Poor financial management
 - iv. Finding alternative sources of funding
 - v. Current and future funding restraints
 - vi. Money, trained and motivated staff, poor management decisions
 - vii. Budget short fall leading to stress at stations. PI's will have to put money into programs
 - viii. Unfortunately, will need buckets of money which means a lot of things
 - ix. Inadequate funding and facilities
 - x. Limited state budget diluted by supporting too many stations
 - xi. Limited resources spread too thin
 - xii. Too much emphasis on generating receipts
 - xiii. Finding adequate sources of funding to support infrastructure and labor
 - xiv. Sell product to generate money
 - xv. Lack of funding of production in ag research
 - xvi. More "pay for play" structure. PI's funding more activities
 - xvii. Resources spread too thin across the stations. Need to concentrate resources towards specific stations
 - xviii. Limited funding

6. Land – quality and quantity of research land

- a. Have stations with no research. Convert from research stations to public parks, demo farms, production centers. Increases funds for other stations
- b. May need to consolidate stations to be efficient. This will involve strategic cuts.
- c. Area to conduct perennial crop trials

- d. Encroachment of industry. Selling prime research (swapping) land for industrial development i.e., Caswell station
- e. No good land close to Raleigh
- f. Too much reliance on “general cropping”
- g. Some reduction in number of stations to increase efficiency and eliminate redundancy
- h. Probably fewer stations in NC
- i. Pressure to sell land
- j. Need large blocks of uniform land for breeding
- k. Encroachment by industry and urban onto good research land
- l. Need facilities close to Raleigh
- m. Soils not best for crops in region (location) close to Raleigh
- n. Lack of uniform land in large quantities
- o. Distance from Raleigh
- p. Fuel and travel costs

What are the opportunities that make achieving efficient and effective agricultural research stations for the future possible?

All three groups responded to the fourth question; the Green Team categorized the information generated and provided the summary.

Summary of the Opportunities	
I.	Good personnel
II.	Management potential
III.	Opportunity to manage better <ul style="list-style-type: none"> a. NCDA Personnel <ul style="list-style-type: none"> i. Good quality workers and managers. ii. Opportunity to do better training/rewards/recognition b. NCSU Personnel <ul style="list-style-type: none"> i. “Intellectual Capital” ii. Research that is in “public eye” c. Public Support <ul style="list-style-type: none"> i. Increase public support d. Communication <ul style="list-style-type: none"> i. Elements of system are in place ii. We have opportunity to improve iii. How do we “knit together” communications?
IV.	Strong public support

- | | |
|------|--------------------------------|
| V. | Research that is in public eye |
| VI. | Intellectual capital |
| VII. | Elements of good communication |

1. Quality personnel

- a. Good hires at research station
- b. Recent superintendent hires have been good people
- c. Station personnel generally accommodating to needs
- d. Many research stations have good staff who work hard
- e. Willing and eager station staff
- f. Motivated superintendent and staff
- g. Some recently hired managers are excellent build on that
- h. Dedication of managers and personnel on certain stations
- i. Two strong resources – NCDA and NCSU. These can complement each other such that the strengths of each are used
- j. New superintendents that are more interested in research
- k. Some station staff are interest in research
- l. Some superintendents/farm workers really care. They should be rewarded for this
- m. Station staff are supportive of teaching and outreach activities
- n. Excellent management and staff at the piedmont research station dairy and field crops areas

2. Public Support

- a. Clientele groups are supportive of relevant field research
- b. We generally have good public support
- c. Existing resource base (people, land, equipment)
- d. Clientele value what we do and the research stations
- e. Willingness to support field days, agent training, graduate/undergraduate research
- f. Growing public interest in “green” and “local” products can be cultivated to enhance support funds
- g. Support of clients in state (commodity organizations, rural population)
- h. Public interest in local farms
- i. Industry is still supportive. They provide sod, seed, fertilizer, irrigation, pesticides (free or at reduced cost)
- j. Unite commodity groups (crops and animals) to gain political support
- k. Maintain and strengthen support from grower groups. Field days meaningful research

3. Research Areas in the public eye

- a. NC is still a leader in agriculture e.g., #2 in pigs, #1 in sweet potatoes, #2 in Christmas trees
- b. Large need for research
- c. Changing demographics in NC – greater diversity / more urban
- d. Fuel food crisis
- e. Young people interested in sustainable food production systems

- f. Marketing! We all need food
- g. Local food movement (need to show how to grow locally)
- h. Potential synergy: NCDA & NCSU playing to strengths of each
- i. Increased consumption of healthy foods

4. Communication

- a. Joint plan including NCDA stations, NCSU Field Labs, and A&T farm
- b. Potential to improve 092 system to provide planning and feedback
- c. Keep positive communications between the research state staff, NCSU scientists, and producers
- d. Communication impacts to local stakeholders to increase political support
- e. Allow scientists to have input on station management evaluations
- f. Collaborative relationships among PI's and station superintendents and personnel
- g. Development of a truly integrated NCDA-University relationship
- h. Develop a review system of stations. Let PI's have input
- i. Highlight why field research is critical to the future of agriculture

5. Intellectual capital

- a. CALS and NCDACS need to think more regionally and globally to expand our efforts. We must place the research stations in the realm of our changing world. How are the important for maintaining competitiveness in NC
- b. Vast resource of ideas from PI's
- c. Expertise is here
- d. Reward innovation
- e. Collaborative projects (funding, equipment, labor)

6. Existing system provides base

- a. There are several tracts of land-expansion and reallocation are possible as resources are present/available
- b. Distribution of station across diverse environmental regions in the state offer opportunities in research stations i.e., breeding
- c. Stations are a resource that can be restructured to work better
- d. We still have an excellent land base – let's not lose any more to encroachment and/or development
- e. The existing research station system is rather good now. We need to build on past successes and more effectively advocate and educate policy makers to continue investing in research stations
- f. Infrastructure does exist. (rebuilding would be very difficult)
- g. Diverse climatic conditions and numerous stations (land) to conduct research to meet the needs of producers in the state
- h. Land available in diverse areas
- i. We have resources to work with stations

7. Odds and Ends

- a. Utilize strengths of our institution to become "Centers of Excellence" in certain programs to better use limited resources
- b. Potential for achieving better integration of station equipment purchases
- c. Reward good station management

- d. Chance to focus resources rather than being everything to everybody

What short-term (immediate) improvements can be made in order to move toward the goal of a state of the art research stations? This includes suggestions for responding to this fiscal year's budget shortfall.

All three groups responded to the fifth question; the Red Team categorized the information generated and provided the summary.

Summary of Short-Term Improvements
<ul style="list-style-type: none">I. Improved Communication<ul style="list-style-type: none">1. Annual meetings with staff and PI's2. PI provide training opportunities for staffII. Dealing with funding challenges<ul style="list-style-type: none">1. PI provide some funding for each project2. promote fiscal transparency/ receipts;3. include (station) operating money in grantsIII. Consolidate Research and Management of Stations<ul style="list-style-type: none">1. All stations are critical to someone2. Plan programs to meet stakeholder needsIV. Management<ul style="list-style-type: none">1. General- address specific needs at special stations2. Use recommended practices at stations3. Irrigation Management- should be operational and expanded4. Cropping/Animal: slow or cease on research outreach activity5. Crop ManagementV. Prioritize Research<ul style="list-style-type: none">1. Do relevant work and reduce or stop outdated or unnecessary (duplicated) workVI. Accountability<ul style="list-style-type: none">1. All partnering organizations should practice mutual oversight and get tough on evaluations of administrators

1. Improved Communication

Annual meetings with staff and PI's; PI provide training opportunities for staff

- a. Station personnel professional development (i.e. understanding of research and conducting of research)
- b. Annual evaluation of stations
- c. Make routine meetings with Superintendent a part of your research program
- d. Have PI's and station management meet to agree on this year's cut

- e. Annual review of station performance by NCSU scientists who conduct experiments at the station
- f. Improve 092; feedback from PI's and Superintendents on how to do this (include end-of-year feedback on what worked, what didn't work, etc.)
- g. Change 092 system; more efficient (report back to PI)
- h. Absolute accountability (audit?) for station management decisions. (time use, labor use, land use, feed use) Recognize efficiency
- i. Meet with faculty/staff at each station to communicate research impacts and long-term vision
- j. Establish at least one public visitor/ outreach center to educate public about where food comes from (at Lake Wheeler?)
- k. Teach staff about good production practices in all crops
- l. Annual, individual PI Superintendent Review
- m. Work to reduce the "US vs. "Them" attitude (NCSU vs. NCDA)
- n. Settle organizational difference (between NCDA, NCSU, and A&T) so we can work in a cooperative environment

2. Dealing with funding challenge : PI provide some funding for each project; promote fiscal transparency/ receipts; including (station) operating money in grants

- a. More transparency as to how receipts that are generated from the research stations are distributed and utilized
- b. Build bridges with local growers/ contractors for in-kind services
- c. Private / Public Partnerships
- d. Non-research cropping should end
- e. Stop bid process for crop products. Sell on contract for just over market price
- f. Start charging what it really costs to conduct research. Stop shielding companies to attract funds
- g. Start giving our programs the funds it really takes to do field research
- h. Encourage a bond Ref. for Ag. Station development
- i. Projects should provide some of the funds to conduct the research on stations
- j. Encourage (make) PI's put some money contribution into every station project
- k. Allow research grants (5-accounts) to help find specific station needs
- l. Find a way to include Res. Station user fees in grant proposals
- m. Increase funding from industry/ commodity groups for specific research projects
- n. Reduce permanent staff, increase salaries of best-performing, hire temporary labor for peak work times
- o. Fiscal transparency
- p. If fees are paid money should go to stations not to "Black hole" of NCSU budget
- q. Urge legislature to hold line on research station budgets

3. Consolidate Research and Management of Stations

All stations are critical to someone; plan programs to meet stakeholder needs

- a. Have some Superintendent oversee multiple "stations" (cluster small stations in limited geographical area)

- b. Investigate ways to reorganize the limited labor resources at the research station, so that the work is still done well and shared equitably
- c. Consolidate upper management of regional stations (not close stations)
- d. Mothball the less used stations and concentrate resources at other stations
- e. Consolidate
- f. Consolidate resources
- g. Close least significant stations and allocate funds to make improvements
- h. Reduce number of stations
- i. Downsize and re-deploy assets
- j. Cut some stations more equipment and personnel to enhance other
- k. Duplication of research eliminated. May result in closings or elimination of jobs
- l. Land is limited at Clayton due to its proximity to campus. May need to relocate on larger piece of the land
- m. Determine whether there is anything we can/should stop doing

4. Management

General- address specific needs at special stations; use recommended practices at stations

Irrigation Management- should be operational and expanded

- water crops on a timely basis
- more capacity to drip irrigate at Clayton and all appropriate station
- irrigation at Lake Wheeler
- make irrigation systems operable
- get irrigation working at Plymouth

Cropping/animal-slow or cease non-research/outreach activity

- a. Having post harvest facilities at appropriate stations to evaluate staff life
- b. Build a bridge over highway 70 at Clayton
- c. A plan to build grading sheds in Kinston over the next few years
- d. New dairy calf research facility at the Piedmont Research Station
- e. Have each station develop list of needs to become more stat of the art. Then prioritize ideas (still need money)
- f. Offer to hold training sessions on areas staff may need improvement
- g. Invest in new mechanization equipment
- h. Encourage stations to use established BMP's to enhance efficiency
- i. Better record-keeping on stations is needed. By years, by specific field. Immediate impact on my program!
- j. Adopt a new 'quality management' structure
- k. Develop station and departmental equipment inventories; prioritize new purchases with feedback from PI's and Superintendents
- l. Stations should practice BMP taught by Extension Personnel
- m. Manage livestock and forages crops according to industry standards

Crop Management

- stop general cropping. Do research only use legume as cover crop (No N fert.)
- use more forage, more legumes, less grain (unless a resh. Trial)
- apply maintenance sprays when needed
- careful strategic planning for perennial and annual crops
- a good plan for crop rotation
- one season research one or two session follow (in non rotation studies)
- a comprehensive plan for handling organic and conventional research

5. Prioritize Research

Do relevant work and reduce or stop outdated or unnecessary (duplicated) work

- a. Prioritize / focus stations
- b. Prioritize research areas
- c. Prioritize programs (resize, reorganize, eliminate)
- d. Prioritize
- e. Prioritize research; eliminate general cropping—stop sending station staff to state fair when there is work to be done on the stations
- f. Prioritize: we cannot do all we have done with fewer resources
- g. Establish an appropriate method to prioritize research projects
- h. Selective pruning

6. Accountability

All partnering organizations should practice mutual oversight and get tough on evaluations of administrators

- a. NCSU Administrators (Research, Extension) should be evaluated by PI's and salary should be public

How can we continue to strengthen the working relationships between the NC A & T, NCDA & CS, and NCSU-CALS?

All three groups responded to the sixth question; the Blue Team categorized the information generated and provided the summary.

1. NCSU & NC A&T Relationships

Encourage more interactions

- a. Provide more opportunities for NCSU and A&T to meet together—identify common research interest and objectives
- b. Funding for shared graduate student positions/ research between NC A&T and NCSU
- c. Faculty study leaves at each other's universities
- d. NCSU Faculty are not very aware of NC A&T Research. Have some type of meeting or figure out how to pair interests. Provide funding for collaboration between NCSU and NC A&T Faculty
- e. Put some NCSU Faculty on loan to NC A&T to teach a class, etc.

- f. Institute faculty trading places between A&T and NCSU for a lecture series—1 week minimum
- g. Let those of us who work at NCSU know who is at A&T and what they do
- h. Meetings/ Conferences to help researchers/regulators/producers communicate with each other—educational sessions

2. Define Business Model

- a. Who are the key players in these organizations?
- b. Clarify roles of the players
- c. The research stations may want to consider adapting a new management structure. Total Quality Management
- d. Remove NCDA from research... each group should have more defined rolls
- e. Recognize the different roles NCDA, NCSU and A&T have—clarify them, and collaborate on issues that they overlap.
- f. Think as a team—not us versus them (NCDA, NCSU, NC A&T)
- g. Strategic plan for each commodity across stations and organizations
Combine training and education of Extension agents and NCDA Agronomists

3. Communication

Clear lines, unified system; enhance supt. And PI (2-way); personal initiative

- a. Improve communication
- b. Clear, open lines of communication
- c. Communications among faculty and stations regarding the opportunity to better utilize resources
- d. Greater communication
- e. NCSU have administrative responsibility in formulating decisions at research stations
- f. Make sure everyone knows who everyone else is and what their respective responsibilities are
- g. 2-way feedback between RS Superintendents and Project Leaders---spotty as is, need to formalize
- h. Effective communication is key. PI's and Superintendents need to work together effectively
- i. Enhance communications between PI's and Station's Staff
- j. PI's need to be more effective in communicating the purpose and importance of the work they are doing with station Superintendents and Personnel
- k. Faculty can better communicate needs and Superintendents can better communicate limitations
- l. Yearly planning meetings between station personnel , PI and their technicians
- m. Use web to allow for better communication at all levels (PI's, Adm.)
- n. NCSU needs to have continuity in research director leadership (has changed at least 3 times in last 7 years)
- o. Involve NCDA Agronomists "in the loop" with regard to the work going on at the stations
- p. Personal interactions
- q. Have regular meetings or conferences of crop science, soil science and NCDA Agronomics division to share research findings and needs

- r. Periodic group meetings with station Superintendents and Managers and Faculty on Campus (Nov.—review seasons work/ Feb- plan season's work)
- s. Have joint reporting systems—work conducted at NCDACS station by NCSU; both organizations should know what was done and impacts

4. Team Building - Admin- play nicely

- a. Eliminate “barriers” between units
- b. Invite each other to speak at programs (e.g. NCDA speak at CALS to learn more about each other programs)
- c. Stop fighting call a truce
- d. Unified administration
- e. Repair relationship between NCDA and NCSU—leave politics out!
- f. Station superintendent—do seminars
- g. Start from the top down. Administrative needs to be setting a cooperative tone
- h. Task force groups to tackle specific areas (ex. NC Fresh Produce Safety TF)
- i. Open door policy (between Troxler and Wynne offices). End strife and work for the good of Ag. research, specifically field research. Put some faculty on loan to NCDA on rotating assignment
- j. More incorporation of station personnel into outside station activities
- k. Share research results with station personnel
- l. Provide training/ education to station personnel
- m. Focus on research, not money generation
- n. Have yearly meetings with all members that worked on a specific topic or commodity...to make sure we're all aware of research in that area and the role each institution is playing
- o. CALS Administration needs to accept a cooperative effort. Last year's drama was viewed as a hostile takeover by NCDA and stakeholders

5. Planning and oversight

- a. Opportunities to meet people working in those other institutions/ agencies
- b. Meetings to gain an understanding of projects
- c. Establishing a mutual relationship (symbiosis) rather than a parasitic (antagonistic) relationship
- d. Realize that it's not about “who has the most toys” but who we are charged to help. (Check your egos at the door)
- e. Be sure exp stations understand significance of research and teaching
- f. Policy on sharing equipment and resources
- g. Have groups work together in-planning and implementing changes
- h. When a new station superintendent is hired, add 1-2 faculty on selection committee
- i. Formalize with a field day; annual station meetings; for all users “get to know you” and improve/ ID opps for collaboration (in terms of equipment, etc.)
- j. Have more and more dynamic meetings like this one!
- k. Make “qualified” station superintendent “field faculty” or adjunct faculty
- l. Work jointly on issues regarding agriculture in NC

- m. Investigate what has worked well (between these types of groups) in other states...don't try to re-invent the wheel
- n. Develop a standard protocol for operationalizing all aspects of research ("Super 0-92")

6. Accountability - All levels

- a. Faculty could do a better job of providing feedback to research station staff about accomplishments that they contributed to
- b. Research stations must be more accountable to NCSU PI's and NC A&T PI's
- c. Making NCDA Technicians accountable to NCSU PI's
- d. Annual review of research outcomes at each station (internal) with all PI's and station staff
- e. PI's along with NCSU Administration involved in research station operation and improvements
- f. Provide mechanism for NCSU scientist feedback on NCDA station management
- g. NCDA needs to be willing to address faculty concerns to improve station function and effectiveness
- h. More transparency in decision-making
- i. Inter link accountability between administrative units and PI's
- j. Greater transparency in operational management (e.g. budgets, personnel, etc.)

7. Resources - Reward structure/ Incentives

- a. Provide Incentives for collaboration
- b. Make it worth everyone's time-grow agriculture
- c. Fund projects
- d. Send summary of work to state legislature
- e. Reward collaboration with money
- f. Improve system of funding stations
- g. Recognize PI contributions (money/in-kind/equipment) to station operations
- h. Money would go a long way to eliminate or reduce our issues which could help with relations
- i. General assembly should maintain and increase funding for research stations that collaborate with NCSU scientists
- j. All stations need to actively share resources when appropriate
- k. Reward creativity of station staff for innovation
- l. Reward collaboration with "recognition" (really value it)

What are the trends that will drive the research needs for the next 10 years in agriculture, natural resources, and the environment?

Each of the participants individually generated responses to the seventh question, and then discussed their responses in the small groups to determine if there were duplications. If an item was duplicated - for example: "healthy food", the group would only post the response one time to the Trends Wall (noting the number of times the duplication occurred on that response). Header categories were provided though anyone could add to this list of categories.

1. Interdisciplinary Collaborative

- a. Mixed cropping systems
- b. Healthy food
- c. Resource recycling (nutrient)

2. Scientific Advances

- a. Application of Genomics to breeding
- b. Increased animal productivity and profitability of production units
- c. Traditional energy source limitation: limits production technology; need to create new crops
- d. Limitations of fish meal
- e. GMO Advances
- f. Improved fertilizer management due to increased costs and environmental concern
- g. Ecological diversity
- h. Many attempts to develop drought tolerance via GMO, most of which will not work because of the complex nature of drought tolerance
- i. Genomics – to phonemics
- j. Bio energy
- k. New crops for NC due to increasing cost to transport
- l. Systems biology
- m. Genetic diversity and genomics
- n. Soil biology (systems)
- o. Increased research emphasis on renewable fuels and energy efficiency
- p. Genomics/Proteomics/Metabolomics applied to plant and animal breeding
- q. Genome maps for Agriculturally relevant organisms (4x)

3. Political

- a. Legislative support/ understanding of agriculture
- b. Global energy crises
- c. Developments in third world economies
- d. Global food crises
- e. Urbanization causing loss of land and Ag. political base
- f. Germplasm – restriction private funding of public
- g. Needs of economically important agricultural sectors

4. Social

- a. Food security (safety)
- b. Consumers wanting increase quality (flavor...)
- c. Increasing animal welfare concerns
- d. Consumer demand for quality protein
- e. A more health conscious public will demand more information on their food. Food safety will become a more important issue
- f. Social issues on use of animals
- g. Food security
- h. “Food security” will drive more local food systems. Community supported food systems are a not a topic driving many programs

- i. Consumer demand for locally produced products
- j. Nutrition and health
- k. Food safety
- l. Local farms
- m. Organic foods
- n. Local, fresh commodities “slow” movement
- o. Developed world diet trends
- p. Resource completion : plant-animal-human
- q. Interest in local and safe food supply
- r. Urbanization- may increase non-traditional ag. support / interest. Examples: turf, organic crops (high values), horticulture crops
- s. GMO concerns
- t. Urbanization causing loss of Ag. land
- u. Declining representation in legislators from rural areas
- v. Increased consolidation of pigs, poultry, meat processing

5. Concerns in Science

- a. De-emphasis on applied research
- b. Unbiased basic research based recommendations will become more rare and needed because reduced public support
- c. Industry driven “food” systems
- d. Centralized, consolidated food supply
- e. Disconnected of research with growers
- f. Loss of trained corporations of plant breeders who really understand non-GMO field breeding
- g. Threats from biological sources (natural and manmade(?)).

6. Educational

- a. Disconnect between public awareness and both agriculture and natural systems

7. Environmental

- a. Nutrient use efficiency
- b. Water use efficiency
- c. Sustainability
- d. Climate change
- e. Environmental sustainability
- f. Climate change and crop production changes
- g. Greater focus on environmental protection and slowing of climate change
- h. Need to move lower on the food chain to increase efficiency and production of agriculture
- i. Utilize food production by-products for animal production
- j. Impact of ag. production on water quality (and air quality)
- k. Water security
- l. Water quality/ quantity
- m. Environmental impacts of agriculture
- n. Increased pressures for clean water and water conservation on farm

- o. Reduced pesticide usage
- p. extinction

8. Economic

- a. Industry-support
- b. Bio-energy
- c. Production efficiency
- d. Restraints on federal and state funding resources
- e. Value-added economic crops
- f. Consolidation of seed industry to few large corporations
- g. Less money for applied research; decrease change/need for traditional research stations
- h. Biofuels interest
- i. Fewer, larger farms
- j. Down turn in U. S. economy will drive decision making
- k. Funding for research
- l. Increasing input cost will drive need for crop rotation and changes in nutrient management (e.g. legumes for nitrogen)
- m. Diminishing money / increased competition for money
- n. Source of funding (industry or other groups that have money)
- o. Declining Petrochemical resources and increased cost of fuel and fertilizer
- p. Food miles?
- q. Funding (money) sources

What criteria should be used to prioritize research needs for the Agricultural Research Stations?

Several small groups generated the top five criteria that should be used to prioritize research needs for the ARS. (See Appendix B for the individual responses of the participants).

Group 1:

1. Economic importance to stakeholders
2. Scientific and educational benefit to society
3. Research focused with long term viability (funding)
4. Does it Integrate basic and applied research to maintain a stable, safe, sustainable food supply

Group 2:

1. Projects that economically and socially benefit growers and consumers
2. Funding available to support project (grant/industry)
3. Projects that improve BMPs
4. Feasibility of projects
5. Food safety and environmental responsibility

Group 3:

1. Funding
2. Relevancy

- a. Current agricultural research
 - b. Future directions
- 3. Benefits to NC
 - a. Societal
 - b. Economic
 - c. Environmental
- 4. Infrastructure
- 5. Advancement of knowledge

Group 4:

- 1. Potential impact of project results
- 2. Ability to do the research with a high probability of success – people, land, animals, equipment, facilities, etc.
- 3. Availability of funding
- 4. Impact on training future scientists

Group 5:

- 1. Value to society and industry
 - a. State (local needs)
 - b. National needs
 - c. World needs
- 2. Meeting needs of industry through applied research
- 3. Evaluation of criteria based on economic impact and potential for growth in North Carolina
- 4. Environmentally/economically sustainable
- 5. Animal well-being, social and production implications

Group 6:

- 1. Economic sustainability and viability for growers
- 2. Contribute to feeding and clothing the world
- 3. Ensuring regional food security/self-sufficiency
- 4. Adapting to challenges of climate change and scarce resources
- 5. Fundability

Group 7:

- 1. Innovation
- 2. In the public interest
- 3. Funded/fundable

Given the trends identified, what are the potential future research needs that the Agricultural Research Stations are uniquely suited to address?

Two groups were organized to respond to the last question. They identified similar research topics that they believe the ARS can uniquely address:

- a. Bio-mass/Bio-fuel/Bio-product Utilization (groups' responses under one header)
- b. Breeding - genetics/adaptation
- c. Research: basic and applied, multi-disciplinary, and bio-medical
- d. Production: Regional Systems and Practices

1. Bio-mass/Bio-fuel/Bio-product Utilization

- a. Making better use of locally available waste/by products for feed/bio-fuel
- b. Bio-fuels – use legumes e.g. peanut and soy
- c. What is the economic potential of bio-fuels?
- d. Bio-fuels and renewable energy
- e. Development of sustainable bio-fuels
- f. Bio-energy

2. Research

- a. Bridge Basic and Applied Research
 - i. Ability to bridge basic and applied research
 - ii. High through put phenotyping to understand genome function
- b. Multi-Disciplinary Research
 - i. Multi-Disciplinary Research
 - ii. Interactions of plant animal climate
 - iii. Mixed cropping systems
- c. Bio-medical Research
 - i. Swine bio-medical research
 - ii. Chickens in bio-medical research
 - iii. Crop enhancements for nutrients, etc.

3. Breeding

a. Breeding and Adaptation

- i. Plant breeding
- ii. Development of cultivates and farming systems that address NC needs and fit local environments
- iii. Potential and adaptation of high-value crops to NC regional environments
- iv. Sandhills station uniquely suited for drought tolerance research
- v. Mycotoxin – free crops
- vi. Applied research to test profitability and sustainability of current and potential crops
- vii. Test adaptability of germplasm to different areas of NC
- viii. Provide facilities for growing plants in a farm production system which permits the appropriate environment for evaluating the genetic diversity of a crop species
- ix. Nutritionally enhanced crops
- x. Broadly adapted crops that can withstand unusual weather patterns
- xi. Sandhills station – identification of drought resistant crops

b. Breeding/Genetics

- i. Evaluation of genetic markers in food animals
- ii. New varieties for niche markets – organic, non, GMO, soy foods
- iii. Can conduct research using large number of genetic lines/strains
- iv. Performance of various varieties and/or breeds in different environments
- v. Efficiency of nutrient utilization in pigs, cattle, and poultry
- vi. Plant and animal breeding/germplasm, enhancement and evaluation

- vii. Response to long term genetic selection of food animals
- viii. Mine germplasm collections to bring new economic genes and overall diversity into farmer's fields
- ix. Given the diverse environments, it is possible to grow soybeans from M6IV to M6VII: It is possible to study genes and genetic pathways in many genetic backgrounds and environments. (Genomic, phenomics) NC has unique environments at national levels.
- x. Unique set of diseases in soybean, understand genotype – environment relationships
- xi. Integrate DNA lab advances with ongoing field breeding
- xii. Beef cattle production in the southeastern US. Genotype x environment interactions
- xiii. Ability to assess new plant materials that can improve the nutrition and health of human beings

4. Production

a. Regional Production Systems

- i. CEFS addresses organic trend, Center for Environmental Farm Systems
- ii. Local and diverse productions systems
- iii. Identifying novel or modified conventional crops suitable for local production
- iv. Organic production systems
- v. Optimizing agronomic efficiency and environmental protection of regional cropping systems
- vi. Sustainable production (environmentally, economically, ethically, socially, etc)
- vii. Provide a field laboratory for solving production problems in the region where they are prevalent or important
- viii. Increasing efficiency of plant/animal production

b. Production Practices

- i. Adapt to “discovery research” to practical uses
- ii. Growth and development of farm animals
- iii. Cooperating field research that cannot be done on commercial farms
- iv. Factors limiting crop production profitability, weeds, pests, labor efficiency, etc
- v. Conduct research in a very cost competitive basis (because we have much in infrastructure in place)
- vi. “New” crop production methods
- vii. Long term research
- viii. What BMPs are relevant to our growers
- ix. Diverse climate, mountains and coastal, clay and sand allows varied research opportunities
- x. Grazing animals forage needs
- xi. Crop protection
- xii. Integrated evaluation of farming systems
- xiii. Improved crop efficiency, water use, nutrient efficiencies

- xiv. Research addressing alternative production methods
- xv. Research at the field (commercial) scale
- xvi. Determination of best management practices for crop and animal production that is economical yet provides environmental stewardship for the various commodity industries served across NC.
- xvii. We can afford to experiment and not be successful profitable
- xviii. Develop/evaluate environmentally sound pest management strategies
- xix. Integrated multi-disciplinary research that impacts production agriculture
- xx. Reproductive efficiency in pigs

5. Multi Environmental Testing

- a. Research addressing grower's needs and problems. However, in some cases on-farm trials. Provide better conditions and situations for special needs
- b. Previous experience with specific crops and nutrient concerns
- c. Placement of Research Stations across state gives representation to major Agro-ecological zones
- d. Research stations give ability for trials to be done in several environments
- e. Research requiring crop destruction such as pesticide evaluations
- f. Research conducted by public entities at Research Stations will help keep recommendations of products in an unbiased realm (objectivity)

6. Societal Issues (Environment, Food Security)

- a. Education of local producers and citizens on specific production systems/products and agriculture in general/e.g. Pre-school or K-7 programs)
- b. Conducting research that may have outcomes that are politically sensitive
- c. Development of local food systems that fit given regions of the state
- d. Impact on water quality in varying landscape types (for different farming systems)
- e. Local agriculture
- f. Animal well-being
- g. Pig behavior and its relationship to animal welfare

7. Faculty Experiences are Diverse

- a. Faculty with diverse expertise
- b. Diverse faculty in place
- c. Produce unbiased research
- d. Existing support very high - already recognized for expertise
- e. Undergraduate and graduate training
- f. Train students in plant breeding for industry jobs

8. New Ag Products

- a. Ornamental Agriculture/container culture
- b. Can do new crops/systems
- c. Agricultural production/diversification
- d. Development of value-added crops
- e. Improved human nutrition products

9. CALS Credibility

- a. The only source of public data in NC
- b. Have confidence of NC Agricultural Community
- c. Public interest over private interest
- d. To get unbiased research based answers to agricultural production
- e. Profit is not the bottom line
- f. Diversity of state – stakeholders spread over state
- g. Respond to grower needs and priorities
- h. Have public support and visibility

10. Climate Change Research

- a. Climate change adaptation. Drought tolerance – Sandhills
- b. Global climate, change and crop production

11. Educational Value

- a. Any research with positive educational outcomes

Closing Summary

Questions from the faculty and responses provided during the closing summary:

1. Question: Where can we locate the program evaluation conducted on the research facilities? Faculty are very interested in the report including the survey they responded to last year and the results of the survey.

Response: The report is available online. We will provide the faculty with a link to access the report including the summary of the survey.

2. Question: When will the draft of the strategic plan be available to faculty?

Responses: It will be sent out by March 1, 2009 for additional comment to the faculty, superintendents, the Strategic Planning Advisory Committee, and other stakeholders as identified.

3. Comment: We need to ensure that the fees generated by a particular research station and the good management of the superintendent, are rewarded. This can be done by returning the receipts generated to that research station, and not to the general pool.

4. Question: Until the strategic plan is completed, how do we determine research needs and plan accordingly?

Response: Given the uncharted waters before the college, work with the superintendents to determine research needs in the meantime.

Appendix A: Parking Lot Topics:

Appreciation

1. In my experience, the research superintendent and staff have been very helpful to my research program over the years, Thanks!

Training & Development:

1. Station Personnel need annual training on equipment, calibration, safety, pesticide, and fertilizer use.
2. Station Personnel sometimes need more training on technical skills
 - a. Drip irrigation
 - b. Sprayer calibration
 - c. Planter calibration
 - d. Fertilizer application rates and application

Process Effectiveness (How something is accomplished)

1. O92's need to be used more effectively
2. Need to actually look at O-92's and follow-up with PI's if questions. Need to implement O-92 THROUGHOUT project.
3. Staff involved with each project should try to function as a team and this team should try to remain intact for multi-year project to maintain consistency
4. We need to stop "piggy backing" projects. If you go onto a station, fill out request. Do not just use a portion of someone else's land.
5. Difficult to use stations and use diverse sites for field days, workshops, etc if they do not use practices taught by Extension personnel throughout the state

Accountability

1. STOP favoritism when assigning physical work within stations
2. ACCOUNTABILITY – acknowledge mistakes, come up with a method to avoid the same mistake, promises should be kept.
3. On the last session before lunch (envisioning future research station system), many important specific suggestions were made, but were not reiterated in the summary. These points should be spoken aloud and administrators should discuss. The best part of this meeting may get lost in the shuffle, otherwise.

Performance: Promotion, Rewards & Evaluation

1. Increase personnel salaries by merit, not years
2. Evaluate stations, managers by PI's
3. Station promotion from within is not always good. Past relationships carry forward (hostilities/favoritisms)
4. STOP – Discrimination in promotions within stations

Decision-Making

1. How can we make a comprehensive plan that excludes U. Field Labs
2. We will probably not be able to serve all commodities and some difficult decision will need to be made
3. On the last session before lunch (envisioning future research station system), many important specific suggestions were made, but were not reiterated in the summary. These points should be spoken aloud and administrators should discuss. The best part of this meeting may get lost in the shuffle, otherwise

Teaming/Collaborations

1. Project Directors and station superintendents should try to develop better teamwork between staff, students, etc. The staff at the research station should feel as though they are contributing to project.
2. Create visibility and presence of research faculty at field day or groups of faculty working on a collaborative project presenting their research
3. Make better use of USDA faculty. As they have access to different funding streams

Appendix B: Listing of Individual Criteria to Prioritize Research Needs for the Agricultural Research Stations

1. Money to fund project
2. Amount of human resources needed based on station labor and project leader labor
3. Ability to conduct research in top notch manner
4. Grower need/ economic impact
5. Public concern
6. Potential impact of project results
7. Innovation
8. Funding extra mural
9. Perceived public benefit
10. Novelty
11. Benefit to NC
12. Expertise
13. Improvements in health/quality of life
14. Novel, but realistic goals with high probability of success
15. Leads to sustainability – food and energy
16. Increase for scientific knowledge
17. Enhancement of the “greater good”; availability of money; market needs; grower priorities/ interests, sustainability
18. Replication vs. Innovation
19. Relevance to approved NCARS research plan
20. Innovation/ originality
21. Environmental protection
22. Availability of funding
23. Resources available; importance of the crop/ commodity to the state
24. Our responsibilities as stated in project
25. Project requests
26. Resources available
27. Economic return/ value
28. Funding
29. Hidden agenda or motives from either PI or those in charge
30. Need to meet global food demands

31. Economic viability; Contribute to environmental sustainability; contribute to national security (economic, food energy, etc.)
32. Criteria for prioritizations and research needs; feed & clothe people; adaptation to climate change; local economic livelihood
33. Improved animal welfare
34. Solving industry/ commodity problems
35. Environmental sustainability
36. Understanding the interplay between animal production and perception by society
37. Applied research that meet needs of animal industry in North Carolina
38. Prevalence of animal industries in North Carolina
39. Will the research improve the well-being of the animal or of ag. systems
40. Value to society
41. Value to industry
42. Marker-assisted breeding in specialty crops (criteria to prioritize research projects)
43. Increased knowledge and use of plant molecular biology (metabolic engineering, etc.)
44. Declining agricultural knowledge will drive research into unidentified areas based upon public perceptions
45. Projects that address needs of society
46. Criteria used for prioritizing research needs at stations; potential impacts (commodity groups, science, local vs regional vs national); multidisciplinary; feasibility (proposal review); findings
47. Development of rural areas (the rural/ urban interface) will lead to more friction between landowners. Ag. will need to market itself as a benefit to society
48. Increased urbanization
49. Does the research contribute to economic development?
50. Are there funds to support the project?
51. Available money?
52. Funds in hands of researchers- where can researchers get money?
53. Are matching funds available?
54. Does the project contribute to the advancement of knowledge?
55. Emerging crops—vision for new crops that have a large future impact
56. Address emerging needs
57. Receipts in NC for commodities (current)
58. Is the crop relevant to NC and/or the SE IS?
59. What is the environmental impact?
60. Does this research: protect the environment
61. Will the project benefit the citizens of NC? Statewide or Local?
62. Economic impact to NC
63. Social impact to NC
64. Local priorities of producers and other residents near specific stations
65. NC- Does this research relate to NC citizens
66. Is there infrastructure to accomplish the research
67. Maintain current strong programs

68. Building on existing strengths at station
69. Economic development
70. Balance between public perception and scientists perception of what is most important
71. Public health vs. International
72. US security
73. Economic impact/value; public support/sustainable (money,); station expertise/conditions
74. Granted supported projects
75. Industry supported projects
76. Needs of productive faculty
77. World need for nutrition
78. Profitability for NC producers, US producers and World producers
79. Positive impact on NC Agriculture
80. Improving livelihood of farmers
81. Maximizing agricultural output per unit of scarce resources
82. Ensuring regional food security/ self-sufficiency
83. Relevance to an existing/ impending problem
84. Not limiting chance of non-tenured faculty from achieving tenure
85. Globalization of agriculture and agricultural trade
86. Global demand for food
87. Less technical support on campus
88. Feasibility of project
89. Expected impact of project (economic, social)
90. Work for the middle, not the fringes (bang for the buck)
91. Relevance to research plan; public benefit (L.T. , S. T.); local economics (L.T., S.T.); number of acres affected (or resources); number of producers affected; number of money involved; food supply; non-food crops; complex systems; consumer/ public support; industry support/ ability to do
92. Research that contributes to safe, low-input production; research that contributes to the top commodities of the state; improved BMPS; contribute to concerns of growers
93. What research/project will benefit the grower and the consumer best? (know your clientele)
94. Global competition
95. Quantify value of research; Significance of results; Long term vs. short term; Probability of success; Resources to get results are available; Uniqueness; Results can be transferred to end users
96. Sustainable support; Top ten (economic) sales in state – concentrate on crop/animal systems that are important to state in terms of production and profits
97. Will this research contribute to the public sector? Will the results be public? If they only contribute to private industry, they should not be on our stations.
98. Stakeholder interest; consumer interest; scientific discovery/priority/reality; balance private sector needs with public good; balance of basic and applied research; do no harm; grant availability; training of grad students' keep contract research in proportion or eliminate; maintain a balanced portfolio.